ecosystems that are now emerging (based on the literature) and their potential feedbacks to the global climate system. I will discuss the implications for biodiversity and ecosystems in southern Africa, especially in the light of recent global trends in fossil fuel-derived greenhouse gas emissions and land use change.

doi:10.1016/j.sajb.2007.02.088

Why do we have vegetation or why don't the foliovores eat all their food?

J.J. Midgley
Department of Botany, University of Cape Town, Private Bag, Rondebosch 7701, South Africa

Given that most parts of most plants are eaten by at least one animal, it has long puzzled ecologists as to why plants seem to have the advantage over animals and enough plant material accumulates and we have vegetation. The wetter parts of the land are green. There are two hypotheses as to why the world is green. The top-down view is that foliovore populations are controlled by their predators and therefore they do not achieve carrying-capacity and so plants escape. The bottom-up view is that most plants are too cruddy to be considered as food for animals and therefore they are ignored by animals. Animals have an absolute nutrient requirement, such as % nitrogen, and cannot eat plants below this threshold. Also that plants defend themselves against defoliation. In my talk I will disagree with the cruddy food hypothesis and suggest a red-queen hypothesis for why we have vegetation. Herbivore physiology has evolved in relation to plant leaf physiology and that nutrient requirements are relative not absolute. The main driving force appears to be atmospheric CO_2 levels.

doi:10.1016/j.sajb.2007.02.089

Grey poplar (*Populus*×*canescens*) in Qwaqwa

P.J. Mojau, R.O. Moffett
University of the Free State — Qwaqwa Campus, Private Bag X13, Phuthaditjhaba 9866, South Africa

A study of the invasive exotic Grey poplar (*Populus*×*canescens*) in Qwaqwa was undertaken between March and September 2006 in order to ascertain whether it was increasing and whether it was of any benefit to the local community. By means of aerial photographs and satellite images it was found that an area of approximately 400 ha comprising many scattered patches was invaded and that there was minimal increase over the last twenty years in urban areas. Interviews with residents using a questionnaire indicated that this was mainly attributed to harvesting by the locals for fuel. In inaccessible areas, however, the trees were increasing. It was also found that the leaves were being browsed by cattle and goats. It was also found that Grey poplar can be manipulated into building core of houses by some residents. A survey of attempts by an outside body to clear the trees by means of herbicides was undertaken and showed that not only was this very difficult and not entirely successful, but very expensive. Recommendations on possible future action are also given.

doi:10.1016/j.sajb.2007.02.090

The effect of dark-chilling on the rate of photosynthesis in soybean

P.W. Mokwala [a], P.D.R. Van Heerden [b], G. Kiddle [c], U.R. Schluter [d], C.H. Foyer [c]
[a] *Department of Biodiversity, Botany Section, University of Limpopo (Turfloop Campus), Private Bag X1106, Sovenga 0727, South Africa*
[b] *School of Environmental Sciences and Development, Botany Section, North-West University (Potchefstroom Campus), Potchefstroom 2520, South Africa*
[c] *Crop Performance Division, Rothamsted Research, Harpenden, Hertfordshire, United Kingdom*
[d] *Forestry and Agricultural Biotechnology Institute (FABI), University of Pretoria, Pretoria 0002, South Africa*

Chilling injury in chilling-sensitive plants leads to reduced yields due to reduced rate of photosynthesis. It is often accompanied by photoinhibition and the production of reactive oxygen species. These processes are enhanced by a combination of low temperature and light. To separate the effect of light from that of low temperature soybean cultivars (one chilling tolerant and the other sensitive) were exposed to low temperature only during the night–dark chilling. The plants were dark-chilled for three consecutive nights and then returned to normal conditions. Measurements were taken during the day for the rate of photosynthesis; internal CO_2 concentration; stomatal conductance; and the rate of transpiration. These measurements were also taken during two days after plants were returned to normal conditions to see how much the plants would recover. The results show that the rate of photosynthesis was much reduced in the sensitive cultivar as compared to the tolerant one. Two days after treatment the rate of photosynthesis recovered fully in both cultivars. The internal CO_2 concentration was slightly reduced in both cultivars. This suggests that the reduced rate of photosynthesis might not be due to low internal CO_2 concentration. Furthermore, the gain in dry mass and rate of nodulation were not reduced.

doi:10.1016/j.sajb.2007.02.091